Ciba Specialty Chemicals Corporatio
North America

Corporate
Remediation Services

Ciba

REC'D
5-12-03
F.B.

May 9, 2003

Mr. Frank Battaglia
USEPA Region III
Office of Site Remediation and Restoration (HBT)
JFK Federal Building
Boston, MA 02203

APPROVED 9/25/03 IN E-MAIL TO ROBERT McNABB
FRANK B
Frank Battaglia

Re: Cranston, RI
Final Stabilization (Thermal Oxidizer/SVE Shutdown Rebound Testing)

Dear Mr. Battaglia:

As you know, the Soil Vacuum Extraction (SVE) and Thermal Oxidizer was shutdown on October 22, 2002, in order to conduct rebound testing. During this shutdown period, the VE wells continued pumping water to the Granulated Activated Carbon (GAC) treatment system.

Rebound Start up History:
On January 6, 2003, the SVE and related equipment was restarted and put back into full operation as planned for rebound testing, which was described in a letter request to you entitled: *Cranston, RI Final Stabilization (Thermal Oxidizer/SVE Shutdown)*, dated September 19, 2002. This letter indicated that if the rebound results returned to the statistically flat rate (3 Standard deviations) within a 30-day period, the system would be permanently shutdown.

During the first hour of rebound run time, one Tedlar Bag sample of the influent vapors to the thermal oxidizer was secured and HNU readings taken hourly for the next seven hours. During the eighth hour, one additional Tedlar Bag sample was secured. The system was then allowed to run unattended overnight.

On January 7, and through January 10, 2003, daily HNU readings and Tedlar Bag samples were secured. Due to the short hold time for the Tedlar bag samples, no samples were secured on Saturday or Sunday the 11th and 12th of January. However, on January 13th and 14th additional Tedlar bag samples and HNU readings were secured. Weekly Tedlar bag samples were also secured on January 20th and 27th, 2003. The last and final scheduled sample was not taken, as per your January 28, 2003 data review and approval to shutdown SVE at that time.

In order to enhance extraction of TVOC vapors in the SWMU-11 area, additional soils were exposed to the effects of vacuum by pumping water from the SVE wells at a rate of 12 gpm. This lowered the water levels in the SWMU-11 vacuum extraction wells approximately five feet. The TVOC in the extracted groundwater averaged 6.8 ppm for the month of January 2003. Previously for the period of March 2001 through July 2003, the TVOC in the extracted groundwater ranged between 6.1 ppm and 19.2 ppm.

Attachment 1 and 2 are charts indicating downward trending of TVOC (HNU and Tedlar Bag analysis) since the approved January 6, 2003 start up.

Throughout the rebound test period, a total of 10 Tedlar bag samples were secured and sent to Lancaster Laboratories for analysis utilizing EPA Method T0-15. The results of these samples were then converted into pounds extracted and the last sample was utilized for calculating the standard deviation. Attachment # 3 is a chart of Mass Removal in Lbs. and Table 3A is supporting data, which indicates that pounds removed are within the acceptable

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standard deviation criteria derived from the prior six-month run period. This indicates that SVE was effective in the removal of mass from the SWMU-11 area and can be discontinued.

Periodic Depth-To-Water (DTW) level readings and vacuum readings were taken measuring vacuum effect on monitoring wells that surround the SWMU-11 area. Vacuum monitoring wells included VE-4, 5, 6, 8, P4S, and MW4S as indicated in Attachment # 4 Figure # 1. Vacuum readings ranging between 0.13" and 0.25" of water were consistently measured at locations VE-4 and VE-5. Vacuum was consistently detected at levels ranging from 0.01 to 0.09"of water at wells VE6, VE8, and P4S. These readings indicate that vacuum was effectively applied within the SWMU-11. However, vacuum was not detected at well MW4S. The fact that this well is located some distance away and outside the former production building foundation may be responsible for the lack of detectable vacuum. It is also possible that readings were below the detection limit of the monitoring instrument.

Attachment # 5 is a chart that indicates downward trending of TVOC to the SVE/Thermal Oxidizer system since the October 2000 start-up of SVE.

The Thermal Oxidizer inlet (TVOC) sampling plan, which is outlined in the September 19, 2002 proposal was modified as per your November 18, 2002, e-mail correspondence to Mr. Dupuis. The revised sampling plan required that additional air sampling and HNU readings be conducted during the startup and rebound test period. In addition, it required measurement of water levels in monitoring wells adjacent to the VE wells to assess draw down and impact on the cone of depression. The plan required the use of Thermox mass removal data, in comparison with the total estimated mass of the original release and the post-shutdown data to assess the effectiveness of the remedy as well.

As requested a soil-sampling plan was formulated that mirrors the original soil-sampling plan with an emphasis on sample points midway between the SVE wells and the original sampling locations. The proposed sampling plan follows.

Proposed Soil Sampling Plan:

Ciba proposes to conduct soil sampling within the SWMU 11 area in order to measure post SVE effects. Baseline sampling and analyses of the soil in this area was conducted in 1990-1991 and June 1997.

Seven borings will be advanced within the SWMU-11 area. From each boring, soil will be sampled continuously (using split-spoon samplers) from two-feet below grade down to the water table. For each soil sample collected, the headspace will be screened along the split-spoon in the field. The sample with the highest headspace concentration, in the permeable soil will be submitted for laboratory analysis. One sample per boring will be analyzed for VOCs. To measure changes in VOC concentrations over time, selected borings will be located near borings advanced during the June 1997 sampling event. Attachment # 4 Figure #1 indicates suggested sampling locations.

RECORD DEPTH OF SAMPLE

Laboratory Analysis - A certified laboratory will analyze the Soil samples for VOCs using Method 8260.

Drilling - A local drilling contractor will perform drilling.

Waste Management - Soil cuttings and water generated during decontamination will be handled as follows:

- Soil cuttings generated during drilling will be returned to its original borehole after that boring is terminated. Soil spoils will not be drummed for subsequent disposal.
- Water generated during decontamination of the drill rig, sampling augers, and sampling tools will not be drummed. Decontamination will be performed down gradient of SWMU-11. Water generated during decontamination would be allowed to infiltrate back into the ground (down gradient of SWMU-11).

Evaluating Mass removal:

Prior to SVE/Thermox operations, base line sampling was conducted in the SWMU-11 area to determine the extent of contamination in the area. In 1990-1991 the average concentration detected in the soil sampled at SWMU-11 was 575 mg/kg. During 1997 an additional study was conducted in the SWMU-11 area by Woodward-Clyde. This study broke the SWMU-11 area into three zones and indicated heterogeneity and reductions in VOC's since the 1990-1991 studies. The 1997 study indicated the total mass in the SWMU-11 area was 285 kg or 627 pounds. The results from the enclosed proposed sampling plan would also be compared to the 1997 study.

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Tracking of TVOC processed through the SVE/Thermox system was initiated in March 2001. For the period of March 2001 through December 2001 approximately 467 pounds of VOC were effectively removed and treated. For the period of January 2002 through October 2002, an additional 66 pounds of VOC was removed. On January 6, 2003, SVE was restarted for rebound testing. After the restart of SVE on January 6, 2003 and through the one month rebound test period, about 4 additional pounds were removed. In total, including pounds removed during the rebound test period, approximately 537 pounds of TVOC were effectively removed and treated since March 2001. Based on the mass calculated (623 lb) from the Woodward-Clyde 1997 study and the total pounds removed (537 lb) by SVE, 86% of the total estimated release has been recovered.

Attachment #6 (8 pages) is a monthly spreadsheet, which indicates Thermal Oxidizer data including, SVE groundwater data, stack, inlet, and cumulative pounds removed since the March 2001 start up of SVE.

Conclusions and Recommendations:

Ciba believes that the foregoing data supports a conclusion that requirements established in the Revised Final Stabilization Design Documents, dated January 1995, and the approved rebounding test criteria, which were established in the September 19, 2003 proposal, have been met.

Ciba respectfully requests EPA approval of the proposed soil sampling plan and the termination of SVE operations at the site. In addition, Ciba is requesting EPA approval to remove all SVE/Thermal Oxidizer equipment and proper abandonment of the SVE wells.

Thank you for your time in this matter. If you have any questions, or need additional information, please contact me at 732-919-2515. I look forward to hearing from you in the near future.

Sincerely,

Robert McNabb
Off-Site Operations Manager

c:
K. Dupuis	Ciba
D. Williams	Ciba
B. Cohen	Ciba
D. Ellis	Ciba
J. Tucker	Ciba
M. Bradley	RIDEM
F. Battaglia (3)	Region III EPA
Ciba File	

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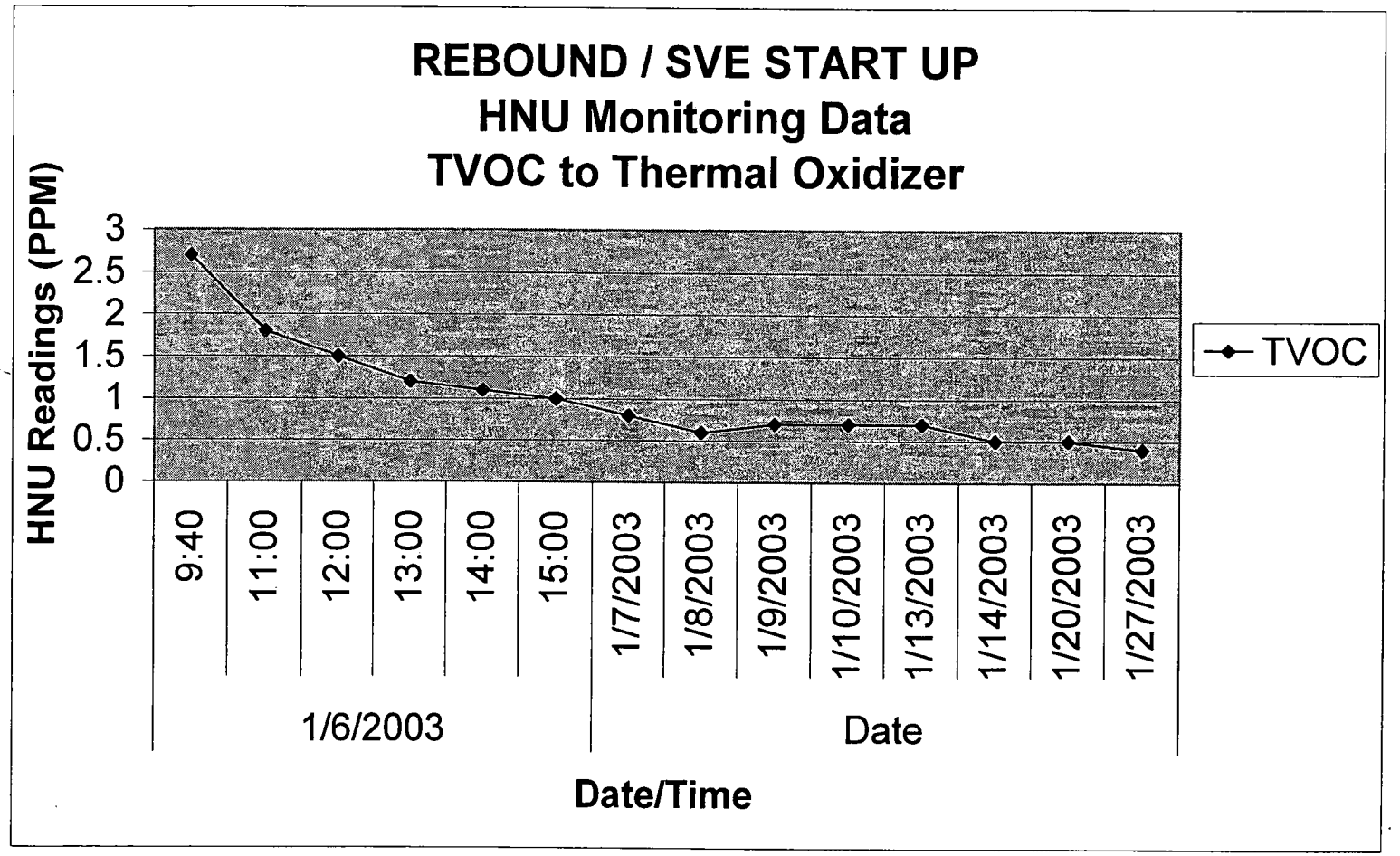
Attachment # 1 (HNU Results/Trends)



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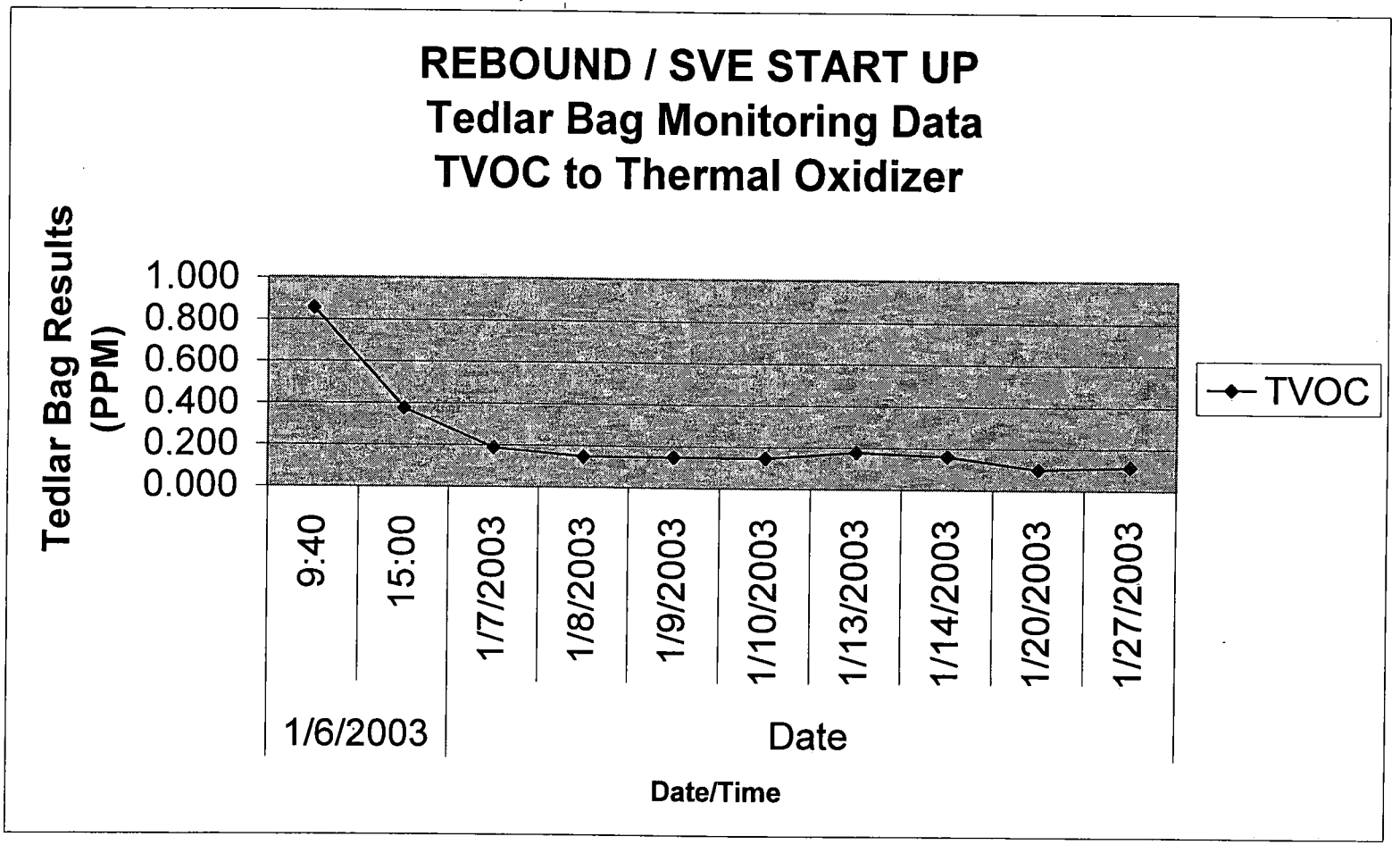
Attachment # 2 (Tedlar Bag Results/Trends)



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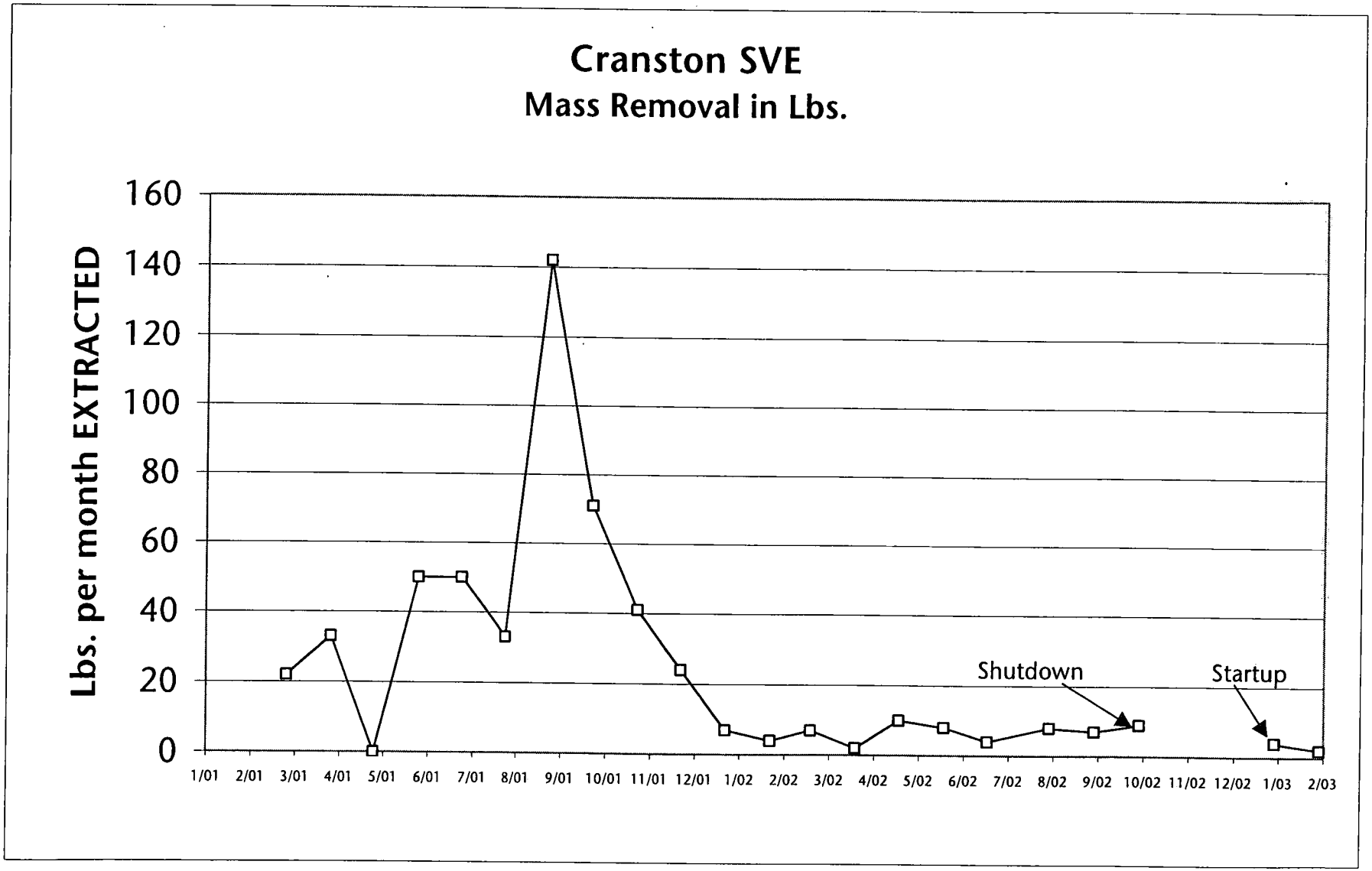
ATTACHEMENT # 3 (Mass Removal in Lbs.)



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ATTACHEMENT # 3-A Support Data (Cranston SVE Standard Deviation)

Month	Day	Lbs/extrd.		
January-01	1			
February-01	2			
March-01	3	22		
April-01	4	33		
May-01	5			
June-01	6	50		
July-01	7	50		
August-01	8	33		
September-01	9	142		
October-01	10	71		
November-01	11	41		
December-01	12	24		
January-02	13	7		
February-02	14	4		
March-02	15	7		
April-02	16	2		
May-02	17	10		
June-02	18	8		
July-02	19	4	Within the standard deviation	
August-02	20	8	Within the standard deviation	
September-02	21	7	Within the standard deviation	
October-02	22	9	Within the standard deviation	
November-02	23		Shutdown of SVE on October 22, 2003	
December-02	24		Shutdown of SVE	
January-03	25	4	Re-start SVE on January 6, 2003	1st month within 3 standard deviations
February-03	26	2	SVE shutdown on January 27, 2003	Final reading taken on January 27, 2003
				Represented in Table and Graphically as February 03 data point, within 3 standard deviations

Standard Deviation/6month period	(Jan to June 2002)
7	
4	
7	
2	
10	
8	
6.33 (mean)	
2.88 (std dev)	
14.96 (mean+3 std dev.)	
-2.29 (mean-3 std dev.)	

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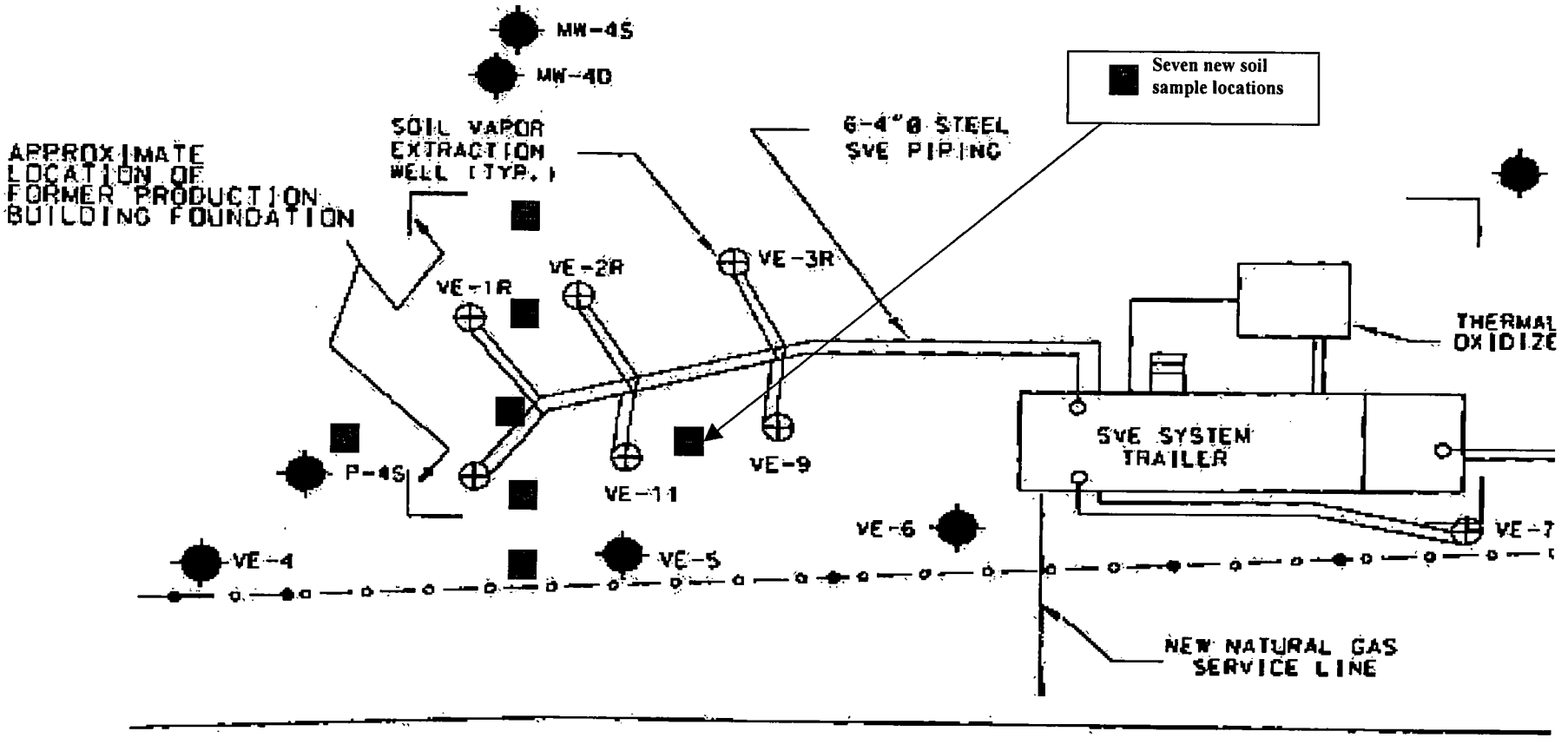
ATTACHMENT # 4 Figure 1 (SVE Monitoring Wells)



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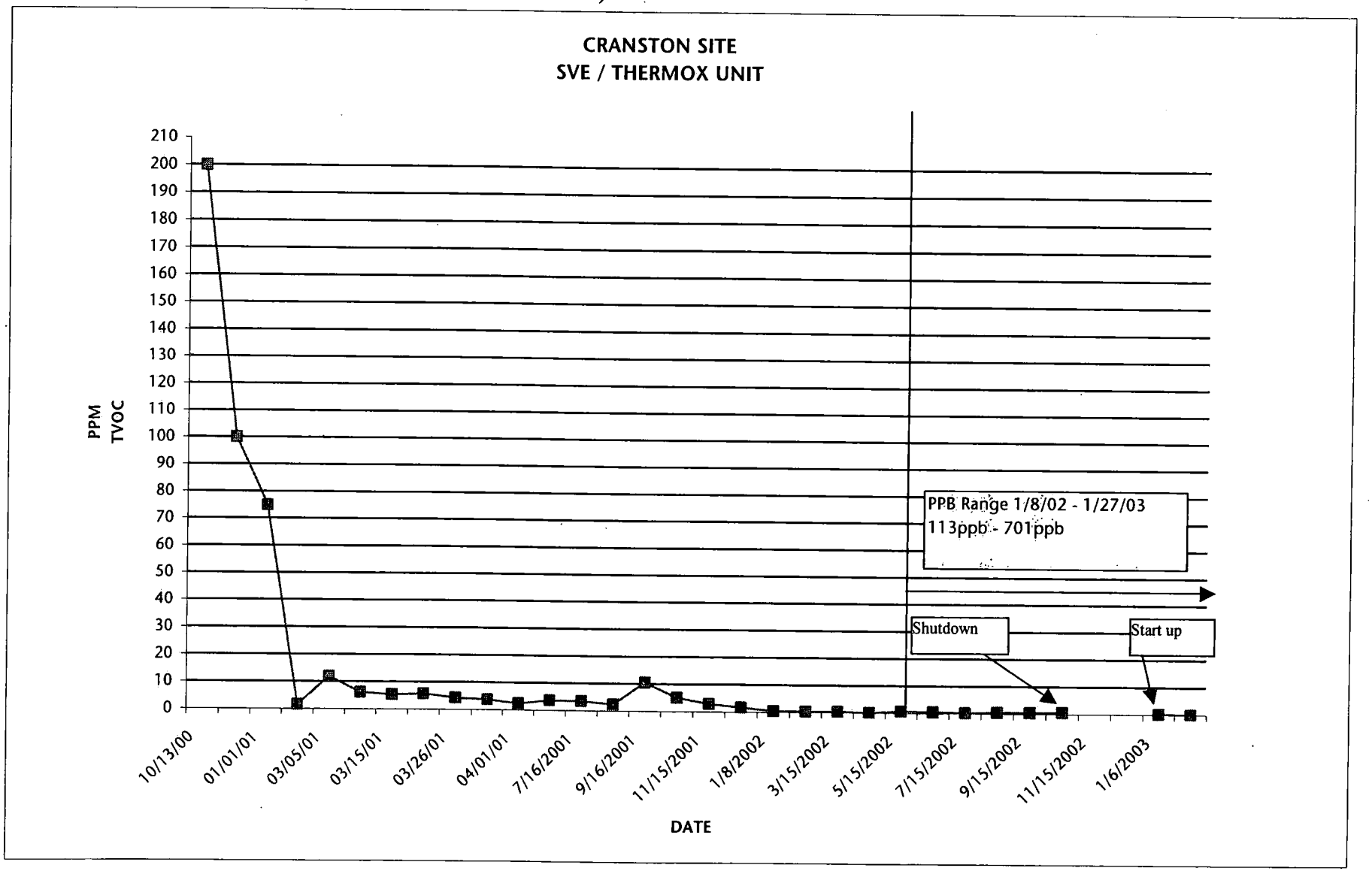
ATTACHMENT # 5 (Monthly TVOC to Thermal Oxidizer)



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ATTACHEMENT # 6 (8 pages) Thermal Oxidizer Data Sheets

CRANSTON SITE: SVE / THERMOX

Date	*Thermal Oxidizer* ~Influent~ (Monthly) TVOC's, (PPB)	Thermal Oxidizer ~Effluent~ (Stack) (Monthly) TVOC's, (PPB)	SVE Groundwater ~Influent~ (Monthly) TVOC's, (PPB)	Comments
March / 2001	1,610 Lbs. / Mo.: 22.4	15	19,080	Thermox / Inf. Toluene = 1,400 ppb Xylenes = 130 ppb SVE Groundwater Toluene = 12,000 ppb Xylenes = 800 ppb 2-CT = 5,700 ppb 4-CT = 330 ppb 1,2-DCB = 100 ppb
April / 2001	2,464 Lbs. / Mo.: 33.2 Cum. Lbs.: 56	Not Sampled	19,267	Thermox / Inf. Toluene = 2,000 ppb Xylenes = 261 ppb SVE Groundwater Toluene = 13,679 ppb Xylenes = 792 ppb 2-CT = 4,152 ppb 4-CT = 314 ppb 1,2-DCB = 95 ppb
May / 2001	Not Sampled	Not Sampled	Not Sampled	
June / 2001	3,740 Lbs. / Mo.: 50 Cum. Lbs.: 106	24	26,612	Thermox / Inf. Toluene = 3,100 ppb Xylenes = 370 ppb SVE Groundwater Toluene = 3,593 ppb Xylenes = 389 ppb 2-CT = 20,837 ppb 4-CT = 1,598 ppb 1,2-DCB = 54 ppb

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CRANSTON SITE: SVE / THERMOX

Date	*Thermal Oxidizer* ~Influent~ (Monthly) TVOC's, (PPB)	Thermal Oxidizer ~Effluent~ (Stack) (Monthly) TVOC's, (PPB)	SVE Groundwater ~Influent~ (Monthly) TVOC's, (PPB)	Comments
July / 2001	3,586 Lbs. / Mo.: 50 Cum. Lbs.: 156	Not Sampled	14,623	Thermox / Inf. Toluene = 2,900 ppb Xylenes = 390 ppb SVE Groundwater Toluene = 4,244 ppb Xylenes = 415 ppb 2-CT = 9,073 ppb 4-CT = 728 ppb 1,2-DCB = 48 ppb CB, EB = 22, 49 ppb
Aug. / 2001	2,384 Lbs. / Mo.: 33 Cum. Lbs.: 189	Not Sampled	7,354	Thermox / Inf. Toluene = 1,600 ppb Xylenes = 460 ppb SVE Groundwater Toluene = 2,718 ppb Xylenes = 265 ppb 2-CT = 3,976 ppb 4-CT = 266 ppb 1,2-DCB = 49 ppb CB, EB = 17, 28 ppb
Sept. / 2001	10,547 Lbs. / Mo.: 142 Cum. Lbs.: 331	29	9,368	Thermox / Inf. Toluene = 8,300 ppb Xylenes =1,360 ppb SVE Groundwater Toluene = 5,086 ppb Xylenes = 316 ppb 2-CT = 3,519 ppb 4-CT = 291 ppb 1,2-DCB = 42 ppb CB, EB = 34, 44 ppb
Oct. / 2001	5,112 Lbs. / Mo.: 71 Cum. Lbs.: 402	Not Sampled	6,927	Thermox / Inf. Toluene = 4,100 ppb Xylenes = 630 ppb SVE Groundwater Toluene = 2,699 ppb Xylenes = 251 ppb 2-CT = 3,546 ppb 4-CT = 313 ppb 1,2-DCB = 28 ppb CB, EB = 25, 34 pp

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Date	*Thermal Oxidizer* ~Influent~ (Monthly) TVOC's, (PPB)	Thermal Oxidizer ~Effluent~ (Stack) (Monthly) TVOC's, (PPB)	SVE Groundwater ~Influent~ (Monthly) TVOC's, (PPB)	Comments
Nov. / 2001	3,045 Lbs. / Mo.: 41 Cum. Lbs.: 443	Not Sampled	6,145	Thermox / Inf. Toluene = 2,300 ppb Xylenes = 520 ppb SVE Groundwater Toluene = 2,550 ppb Xylenes = 241 ppb 2-CT = 2,977 ppb 4-CT = 261 ppb 1,2-DCB = 33 ppb CB, EB = 31, 27 ppb
Dec. / 2001	1,708 Lbs. / Mo.: 24 Cum. Lbs.: 467	Not Sampled	5,628	Thermox / Inf. Toluene = 1,200 ppb Xylenes = 360 ppb 2-CLTOL = 3,500ppb SVE Groundwater Toluene = 2,200 ppb Xylenes = 217 ppb 2-CT = 2,900 ppb 4-CT = 240 ppb 1,2-DCB = 24 ppb CB,EB = 25, 22 ppb

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CRANSTON SITE: SVE / THERMOX

Date	*Thermal Oxidizer* ~Influent~ (Monthly) TVOC's, (PPB)	Thermal Oxidizer ~Effluent~ (Stack) (Monthly) TVOC's, (PPB)	SVE Groundwater ~Influent~ (Monthly) TVOC's, (PPB)	Comments
Jan. / 2002	484 Lbs. / Mo.: 6 Cum. Lbs.: 473	15	4,437	Thermox / Inf. Toluene = 370ppb Xylenes = 34 ppb 2-ClTol = 340ppb SVE Groundwater Toluene = 2,077 ppb Xylenes = 164 ppb 2-CT = 1,994 ppb 4-CT = 132 ppb 1,2-DCB = 22 ppb CB, EB = 26, 12ppb
Feb. / 2002	338 Lbs. / Mo.: 5 Cum. Lbs.: 478	Not Sampled	5,869	Thermox / Inf. Toluene = 310 ppb Xylenes = 22 ppb 2-ClTol = 229 ppb SVE Groundwater Toluene = 2,454 ppb Xylenes = 238 ppb 2-CT = 2,887 ppb 4-CT = 200 ppb 1,2-DCB = 29 ppb CB, EB = 22, 19 ppb
March / 2002	480 Lbs. / Mo.: 7 Cum. Lbs.: 485	Not Sampled	5,761	Thermox / Inf. Toluene = 430 ppb Xylenes = 20 ppb 2-ClTol = 308 ppb SVE Groundwater Toluene = 2,182 ppb Xylenes = 198 ppb 2-CT = 3,100 ppb 4-CT = 196 ppb 1,2-DCB = 29 ppb CB, EB = 21, 23 ppb

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Date	*Thermal Oxidizer* ~Influent~ (Monthly) TVOC's, (PPB)	Thermal Oxidizer ~Effluent~ (Stack) (Monthly) TVOC's, (PPB)	SVE Groundwater ~Influent~ (Monthly) TVOC's, (PPB)	Comments
April / 2002	134 Lbs. / Mo.: 2 Cum. Lbs.: 487	16	6,354	Thermox / Inf. Toluene = 100 ppb Xylenes = 5 ppb 2-ClTol = 65 ppb SVE Groundwater Toluene = 5,767 ppb Xylenes = 377 ppb 2-CT = 4,209 ppb 4-CT = 310 ppb 1,2-DCB = 57 ppb CB, EB = 64, 59 ppb
May / 2002	701 Lbs. / Mo.: 10 Cum. Lbs.: 497	Not Sampled	7,984	Thermox / Inf. Toluene = 530 ppb Xylenes = 33 ppb 2-ClTol = 127 ppb SVE Groundwater Toluene = 2,165 ppb Xylenes = 551 ppb 2-CT = 4,813 ppb 4-CT = 353 ppb 1,2-DCB = 64 ppb CB, EB = 16, 8 ppb
June / 2002	563 Lbs. / Mo.: 8 Cum Lbs.: 505	Not Sampled	9,515	Thermox / Inf. Toluene = 30 ppb Xylenes = 3 ppb SVE Groundwater Toluene = 3,227 ppb Xylenes = 260 ppb 2-CT = 5,481 ppb 4-CT = 385 ppb 1,2-DCB = 52 ppb CB, EB = 31, 49 ppb

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Date	*Thermal Oxidizer* ~Influent~ (Monthly) TVOC's, (PPB)	Thermal Oxidizer ~Effluent~ (Stack) (Monthly) TVOC's, (PPB)	SVE Groundwater ~Influent~ (Monthly) TVOC's, (PPB)	Comments
July / 2002	282 Lbs. / Mo.: 4 Cum. Lbs.: 509	37	11,561	Thermox / Inf. Toluene = 180 ppb Xylenes = 14 ppb SVE Groundwater Toluene = 3,679 ppb Xylenes = 259 ppb 2-CT = 6,860 ppb 4-CT = 623 ppb 1,2-DCB = 43 ppb CB, EB = 30, 47 ppb
Aug. / 2002	550 Lbs. / Mo.: 8 Cum. Lbs.: 517	Not Sampled	5,095	Thermox / Inf. Toluene = 370 ppb Xylenes = 41 ppb SVE Groundwater Toluene = 1,968 ppb Xylenes = 183 ppb 2-CT = 2,647 ppb 4-CT = 208 ppb 1,2-DCB = 32 ppb CB, EB = 29, 19 ppb
Sept. / 2002	509 Lbs. / Mo.: 7 Cum Lbs.: 524	Not Sampled	6,716	Thermox / Inf. Toluene = 320 ppb Xylenes = 84 ppb SVE Groundwater Toluene = 2,373 ppb Xylenes = 229 ppb 2-CT = 3,737 ppb 4-CT = 268 ppb 1,2-DCB = 38 ppb CB, EB = 28, 26ppb

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Date	*Thermal Oxidizer* ~Influent~ (Monthly) TVOC's, (PPB)	Thermal Oxidizer ~Effluent~ (Stack) (Monthly) TVOC's, (PPB)	SVE Groundwater ~Influent~ (Monthly) TVOC's, (PPB)	Comments
Oct. / 2002 Note: SVE shut Down from October. 22, 2002 thru January 5, 2003.	654 Lbs. / Mo.: 9 Cum. Lbs.: 533	35	7,570	Thermox / Inf. Toluene = 540 ppb Xylenes = 31 ppb SVE Groundwater Toluene = 2,444 ppb Xylenes = 212 ppb 2-CT = 4,478 ppb 4-CT = 315 ppb 1,2-DCB = 42 ppb CB, EB = 40, 22 ppb
Nov. / 2002	Not Sampled Lbs. / Mo.: - Cum. Lbs.: 533	Not Sampled	9,856	Thermox / Inf. Toluene = -- ppb Xylenes = -- ppb SVE Groundwater Toluene = 5,050 ppb Xylenes = 314 ppb 2-CT = 4,036 ppb 4-CT = 292 ppb 1,2-DCB = 45 ppb CB, EB = 63, 37 ppb
Dec. / 2002	Not Sampled Lbs. / Mo.: Cum Lbs.: 533	Not Sampled	7,463	Thermox / Inf. Toluene = ppb Xylenes = ppb SVE Groundwater Toluene = 2,623 ppb Xylenes = 223 ppb 2-CT = 4,224 ppb 4-CT = 294 ppb 1,2-DCB = 32 ppb CB, EB = 26, 22 ppb

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Jan. / 2003	Jan. 6 a.m. 858 Jan. 6 p.m. 376 Jan. 7 188 Jan. 8 148 Jan. 9 150 Jan. 10 146 Jan. 13 178 Jan. 14 160 Jan. 20 101 Avg.: 256 ppb Lbs. / Mo.: 4 Cum. Lbs.: 537	Not Sampled	(1/9/03) 6,765	Thermox / Inf. (Avg.) Toluene = 225 ppb Xylenes = 17 ppb SVE Groundwater Toluene = 2,928 ppb Xylenes = 256 ppb 2-CT = 3,243 ppb 4-CT = 205 ppb 1,2-DCB = 48 ppb CB, EB = 49, 21 ppb
Feb. / 2003 Note: SVE shut down on Jan. 30, 2003. Final reading taken on Jan. 27, 2003, Represented in table as Feb./03 data point.	113 Lbs. / Mo.: 2	Not Sampled	(2/5/03) 2,114	Thermox / Inf. Toluene = 99 ppb Xylenes = 8 ppb SVE Groundwater Toluene = 460 ppb Xylenes = 92 ppb 2-CT = 1,448 ppb 4-CT = 80 ppb 1,2-DCB = 20 ppb CB, EB = 9, 4 ppb

CALCULATION:

$$\text{Lbs / Month Total Organics (Calc. As Toluene)} = \frac{\text{Total PPM (V)} \times 53016 \times 92.1 \times \text{No. Days in Month}}{24{,}000 \times 453.6}$$

53,016 = cubic meters per day
92.1 = molecular weight of Toluene
24,000 = volume (ml) occupied by one mole of Toluene
453.6 = grams per pound

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P.O. Box 71
Toms River, New Jersey, 08754-0071
Tel. 732-914-2552

Frank Battaglia

09/25/2003 05:14 PM

To: Mcnabb Robert BC US <robert.mcnabb@cibasc.com>
cc: Cohen Barry BC US <barry.cohen@cibasc.com>, Tucker John BC US <john.tucker@cibasc.com>
Subject: Re: SVE Shutdown and Sampling Plan-EPA Approval with modifications

September 25, 2003,

Bob, I have reviewed the SVE shutdown and sampling plan dated 5/9/03 and **approve** of the plan with a few modifications. First, I believe you should locate and sample an eighth boring between VE-2R and VE-3R; second you should sample during the seasonally low groundwater period; and third you should record the depths of each sample taken and compare the results with previous data. In addition, **EPA approves** the removal of all SVE/Thermal Oxidizer equipment and abandonment of the SVE wells. Please be reminded that all work should be conducted using EPA approved methods and proper well abandonment procedures per all applicable federal, state and local regulations. If you have any questions, please contact me at (617) 918-1362.

Sincerely,

Frank Battaglia,
RCRA Facility Manager